

REMARKS

Claims 1-21 stand rejected under 35 USC §112, second paragraph, as being indefinite. The Examiner has detailed numerous items of indefiniteness, each of which has been addressed by amendment or will be explained below.

With regard to claim 1, in the Examiner's third paragraph of claim 1 rejections on page 2, the Examiner finds it unclear as to what was meant by the phrase "plenum vacuum connection" (line 9 of amended claim 1). Claim 1 has been amended to precisely define this phrase as a connection "between an upstream end of the vacuum channel and the vacuum plenum".

Regarding the Examiner's second rejection of claim 2 on page 2 of the Office Action, the amendment to claim 1 discussed above is believed to address and overcome this rejection.

In the third paragraph of claim 8 rejections on page 3, the Examiner indicates there is insufficient antecedent basis for the limitation "the vacuum opening" in line 4. This rejection is believed to be in error because in line 2 of claim 8 there is the recitation of "a vacuum opening".

With regard to the sixth paragraph of claim 13 rejections on page 4, applicants believe no correction is needed. The recitation in line 17 is "the upstreammost valve" not "the upstream valve" as indicated by the Examiner.

In the last two paragraphs of claim 21 rejections on page 6, the Examiner finds no antecedent basis for the limitation "the vacuum opening" (lines 4-5) and "said vacuum opening" (line 6). However, applicants respectfully suggest that the recitation of "a vacuum opening" in line 3 of claim 21 provides the appropriate antecedent basis and, therefore, no amendment is required.

Claims 1-5, 7-14 and 16-20 stand rejected under 35 USC §112 as unpatentable over Kuzniak (U.S. 3,845,950) in view of Louis et al (U.S. 4,411,420). This Office Action and the rejection of the claims above was made final.

The Examiner has applied the same arguments in rejecting the foregoing claims as in the prior Office Action. The applicants, in turn, strongly reiterate the remarks made in

their last response in arguing over the rejections and in distinguishing their invention over the cited prior art. Those remarks are expressly incorporated by reference herein.

However, applicants have also made further clarifying amendments to independent claims 1 and 13 which support the distinctions between applicants' apparatus and the prior art and, it is respectfully submitted, render all of claims 1-21 allowable.

A most important distinction between applicants' apparatus and the apparatus of Kuzniak (either alone or as modified by Louis et al) is that Kuzniak requires an extremely high air flow, resulting in great operating inefficiency. High air flow also results in higher energy consumption, high noise and the generation of more dust, the latter especially undesirable in the conveyance of freshly printed sheets. In this regard, and as now believed to have been made even more clear in the amendments to claims 1 and 13, with the blower in operation and with no sheet present on the conveyor belts, applicants' control valves 34 are held closed and are effectively sealed against leakage. As a result, the air flow is limited to the starter openings 30 and is substantially lower at this stage of operation than Kuzniak.

In Kuzniak, by comparison, with no sheet present on the apparatus, all of the valves or obturators 9A, 9B, etc. are wide open resulting in a tremendously high air flow (i.e. beyond the value indicated by point C in the Fig. 7 graph of Kuzniak.

This important distinguishing feature of applicants' apparatus has been clarified by the foregoing amendments to claims 1 and 13 that now unequivocally recite that the vacuum control valves are closed when there is no sheet present over the plenum surface. Again, this is completely opposite the Kuzniak device where, at the starting point, all of the valves are open.

In addition, when the vacuum control valves 34 of applicants device are closed, they are effectively sealed against air loss. This also contributes to the low air flow requirements of applicants' device. In Kuzniak, by comparison, the valves (obturators) 9A, 9B, etc. or the equivalent devices in alternate embodiments, always leak substantially and, as noted in applicants prior response, this high leakage permits the Kuzniak system to achieve nearly full plenum vacuum even before the valves are fully open.

The differences between applicants' apparatus and the device of Kuzniak are graphically demonstrated on the enclosed Charts 1 and 2, the latter based on Fig. 7 of Kuzniak. Looking first at the blue line on Chart 1, it is clear that Kuzniak does not close the obturators

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9A, 9B, etc. until the first opening 7 is covered by the incoming sheet, as indicated by the steep jump in vacuum. In Chart 2, this is indicated by the portion of the curve from point C to point B. When the first opening 7 is completely covered, the vacuum level rises from point B to point A in Chart 2 and increases the sheet holding vacuum, but only slightly from the 75%-80% of full system vacuum achievable merely by the leak in the valve (obturator 9A). If the obturator 9A in Kuzniak did not close, the vacuum level would not increase sufficiently to permit the system to gain control of the sheet and carry it to the next location until enough of the sheet covered the plenum.

In applicants' apparatus, on the other hand, the significant operational difference is shown between points D and E on Chart 2. In Chart 1, the corresponding red line trace shows that the vacuum level is substantially flat whether there is a sheet on the conveyor or not and the vacuum level is high enough to carry the sheet whether it is only 10% on the conveyor or 100% on the conveyor. Once the sheet passes the valves, the valves serially close returning to a no flow condition. In Kuzniak, passage or discharge of the sheet results in the obturators reopening with a large and wasteful air flow.

The yellow line trace on Chart 1 shows the extended high vacuum level required when the Kuzniak device is used as a conveyor, instead of a stacker.

Claims 1-21, as amended herein, are now believed to be in condition for allowance and further favorable action is respectfully requested.

Respectfully submitted,

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Chart1

Vacuum Level As Sheet Moves Onto and Off of The Conveyor

